US007126446B2

(12) **United States Patent**
Howell et al.

(10) **Patent No.: US 7,126,446 B2**
(45) **Date of Patent: Oct. 24, 2006**

(54) **SELF-RETRACTING FULLY COMPLIANT BISTABLE MICROMECHANISM**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 148 days.

(21) Appl. No.: **10/480,367**

(22) PCT Filed: **Jun. 14, 2002**

(86) PCT No.: **PCT/US02/18769**

§ 371 (c)(1),
(2), (4) Date: **Dec. 10, 2003**

(87) PCT Pub. No.: **WO03/003396**

PCT Pub. Date: **Jan. 9, 2003**

(65) **Prior Publication Data**

US 2004/0183632 A1 Sep. 23, 2004

Related U.S. Application Data

(63) Continuation-in-part of application No. PCT/US01/28614, filed on Sep. 12, 2001, and a continuation-in-part of application No. PCT/US01/22661, filed on Jul. 18, 2001.

(60) Provisional application No. 60/298,789, filed on Jun. 15, 2001.

(51) **Int. Cl.**
H01H 51/22 (2006.01)

(52) **U.S. Cl.** **335/78**; 200/181

(58) **Field of Classification Search** 335/78; 200/181

See application file for complete search history.

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(57) **ABSTRACT**

A micromechanism (**104**) with two unique, stable configurations is disclosed. The micromechanism (**104**) has a base member (**120**) and a shuttle (**122**) designed to move in linear fashion. The shuttle (**122**) is coupled to the base member (**120**) via a coupling (**26**) in which flexible members (**50**, **52**) are placed under axial tension in addition to bending. The coupling (**26**) also has a compressive member (**54**) that is compressed as the flexible members (**50**, **52**) are placed in tension. The shuttle (**122**) has a displacement between the stable configurations that is suitable for use with thermomechanical microactuators and microswitching applications. Such a micromechanism may have multiple couplings (**26**), which may be disposed on either side of the shuttle (**122**) and may be attached to multiple base members (**120**). An electric return signal may be applied to the micromechanism to thermally relax the couplings (**26**), thereby promoting the micromechanism (**104**) to return from the second stable configuration to the first stable configuration. Alternatively, a separate return actuator may be used.

29 Claims, 5 Drawing Sheets